United States
Environmental Protection
Agency

Office of Research and
Development
Washington DC 20460

EPA/600/F-97/009
August 1997

EPA

1998 EPA SCIENCE TO ACHIEVE RESULTS (STAR) RESEARCH GRANTS

Announcement of Opportunity

- Exploratory Research
- Indicators of Global Climate Change
- Interindividual Variation in Human Susceptibility to Environmentally-caused Disease

Opening Date: August 15, 1997

SEE INDIVIDUAL TOPICS FOR APPLICATION SUBMISSION CLOSING DATES

NATIONAL CENTER FOR ENVIRONMENTAL RESEARCH AND QUALITY ASSURANCE

EPA does not intend to mail this announcement in large quantities. Additional information, forms, etc., should be obtained by consulting our Internet Homepage **<http://www.epa.gov/ncerqa>** and downloading whatever is needed

The United States Environmental Protection Agency
Office of Research and Development
National Center for Environmental Research and Quality Assurance

1998 Science To Achieve Results (STAR) Grant for Research

on

Exploratory Research
Indicators of Global Climate Change
Interindividual Variation in Human Susceptibility to Environmentally-caused Disease

Announcement of Availability

Opening Date: August 15, 1997.....Closing Dates: See Sorting Codes section for each grant topic

Introduction

In this announcement the U.S. Environmental Protection Agency (EPA), Office of Research and Development (ORD), invites research grant applications in the following areas of special interest to its mission:

1. Exploratory research
2. Indicators of Global Climate Change
3. Interindividual variation in human susceptibility to environmentally-caused disease

This invitation provides relevant background information, summarizes EPA's interest in the topic areas, and describes the application and review process.

Background

In fiscal year 1995 EPA began an expansion of its investigator-initiated research grants program for academic and not-for-profit institutions (the STAR Program, Science to Achieve Results). As a part of that program, this Request for Applications (RFA) describes several of the programmatic areas from the EPA 1998 solicitation. Additional program topic areas and joint programs with the National Science Foundation and other agencies will be announced separately via a multi-agency soliciation.

EPA Mission and R & D Strategy

The mission of EPA is to protect both environmental quality and human health. Achievement of this mission requires the application of sound science to the assessment of environmental problems and to the evaluation of possible solutions. A significant challenge is to support both long-term research that anticipates future environmental problems as well as research that fills gaps in knowledge relevant to meeting current Agency goals. This Request for Applications and the multi-agency solicitations are important steps toward promoting a sound scientific foundation for environmental protection.

EPA's research programs focus on reduction of risks to human health and ecosystems and on the reduction of uncertainty associated with risk assessment. Through its laboratories and through grants to academic and other not-for-profit institutions, EPA promotes research in both domains, according the highest priority to those areas in which risk assessors are most in need of new concepts, methods, and data. EPA also fosters the development and evaluation of new risk reduction technologies across a spectrum, from pollution prevention through end-of-pipe controls to remediation and monitoring. In all areas, EPA is interested in research that recognizes issues relating to environmental justice, the concept of achieving equal protection from environmental and health hazards for all individuals without regard to race, economic status, or culture.

EPA's extramural research grant programs are administered by ORD's National Center for Environmental Research and Quality Assurance (NCERQA). The individual topic areas are discussed below.

RESEARCH TOPICS OF INTEREST

1. Exploratory Research

The mission of EPA is to provide environmental policies, risk assessments, pollution prevention programs, and effective regulations for environmental protection based on sound science. EPA's support for long-term research strives to fill significant gaps in knowledge relevant to protecting the environment. In part, these goals may be accomplished through this competitive, peer reviewed extramural program in which investigator-initiated projects research can discover solutions to environmental problems and EPA can benefit from close cooperation with the scientific community. Specifically, NCERQA is seeking grant applications to conduct exploratory environmental research based on investigator-initiated proposals in the broad areas listed below. The examples of possible study areas are provided as a guide and should not be interpreted to exclude other studies relevant to the broad topic area.

A1. Environmental Biology. Examples of studies in this area include investigations to elucidate and increase our understanding of environmental biological processes at the molecular, cellular, organism, or population level. The ultimate application of this knowledge should be to understand and quantify the impact human activities or environmental pollution may have on biological systems.

A2 Human Health. Applications submitted in this topic may focus on determining the impact that exposure to environmental stressors may have on human health. Specifically, toxicological studies for non-cancer (e.g., immune system effects) or cancer endpoints may be considered. The results of these studies should be applicable to environmentally targeted health risk

assessments through improving hazard identification, dose-response assessment, exposure assessment, or risk characterization methods.

A3. Environmental Chemistry. Applications submitted in this area may focus on the reaction of chemicals in various environmental media (e.g., air, soil, water) and models predicting the transformation of chemicals in the environment. In addition, studies developing unique or novel techniques for monitoring chemicals in the environment would be of interest.

A4. Physics. Applications in this area may focus on increasing our knowledge of physical processes in the environment, developing models describing the physical transport of anthropogenic substances through the environment, or describing how human activities may impact physical processes in the environment.

A5. Environmental Engineering. Applications in this area may include control, remediation, and prevention technology approaches toward solving high priority environmental problems. Studies focusing on clean products and processes that may prevent pollution are of particular interest. Similarly, analytical tools and methods that assist in the identification of pollution prevention approaches would be important. Development of new technologies to address emerging environmental pollution concerns (e.g., treatment technologies for removing fuel additives from water) are also of interest.

Funding: Approximately $6 million is expected to be available in FY 98 for new exploratory research grants. The projected award range is $75,000 to $125,000/year for up to 3 years. Awards are subject to the availability of funds.

B. Indicators of Global Climate Change

The goal of the Indicators of Global Climate Change competition is to develop a suite of methods, measurements, and models which can be used to detect and document significant, directional, and lasting changes in ecosystem sustainability and integrity. These changes can be evidenced in the structure and function of natural species populations, plant and animal communities, and regional ecosystems, found in terrestrial, freshwater and estuarine environments. Direct evidence of ongoing or impending impacts of climate changes can provide critical information for policy makers who must address difficult policy decisions regarding U.S. actions. Development of indicators of climate change, therefore, is a significant research need that EPA is uniquely positioned to address given ORD's research capabilities in indicator development and analysis.

Fundamental difficulties exist in the detection and documentation of ecological impacts of global change. Ecological change can occur and be detectable at a variety of scales, from local to regional to global. However, the impacts of global environmental change of concern to citizens and decision-makers are those that affect life at regional to local levels. Yet, in any given region, a measured ecological change usually can be attributed to one or more of a wide variety of forces operating there, such as increasing resource extraction, declining soil fertility, urban-suburban growth, changing atmospheric pollutant loads, land use fragmentation of landscapes, etc., in addition to the chronically changing seasonal temperature, humidity, and precipitation patterns. Because ecosystems are dynamic and undergo change as a function of time and in response to changing stressors, it is difficult to specifically identify whether and how climate change is affecting ecosystems.

Therefore, this competition requests proposals designed to distinguish, quantify and evaluate local or regional ecological impacts of global climate change in the context of other environmental changes. The competition will focus on developing indicators of ecological impacts within the United States of changing (a) global climate and (b) greenhouse gas (GHG) concentrations. The indicators produced will necessarily involve ecological processes in ecosystems which are modeled and measured in several regions.

Background

Based on current U.S. Global Change Research Program priorities, EPA's research program focuses on ecological vulnerabilities in the United States to climate change, the implications for human health, and mitigation and adaptation approaches. Research is conducted on terrestrial, aquatic, and coastal ecosystems. Specifically, the mission of ORD's global change research program is to improve the scientific basis for evaluating important ecological and human health impacts posed by climate change in the context of other stressors, and to improve our understanding of the best ways to manage the most significant of these impacts. A draft strategic plan is available on the Internet at http://www.epa.gov/ord/resplans/gccplan.pdf.

The Indicators of Global Climate Change RFA is new in the Science To Achieve Results (STAR) Program for FY 1998. This RFA complements ongoing research for both the Global Change Program and the Environmental Monitoring and Assessment Program (EMAP). EMAP is focused on providing estimates of current and changing conditions of ecological resources at regional and national scales, while the Indicators of Global Climate Change RFA is focused on detecting and evaluating local to regional ecological impacts that can be specifically attributed to global changes in climate and GHG concentrations. Hence, despite similarities in the projects funded by EMAP and by Indicators of Global Climate Change, the programs have fundamentally different objectives.

This solicitation is focusing on two (among many) functions of indicators:

Indicators of ecological impacts can be used to document global change cause and effect directly. The challenge is to demonstrate that already measured shifts in

climate and/or GHG concentrations are both necessary and sufficient sources of ecosystem changes which are hypothesized and detected in the field. This role requires *a priori* creation of a cause and effect hypothesis (model). Measurements on specific ecological variables then are designed to simultaneously test the model and to eliminate other candidate causes of the ecological change.

Indicators can also serve as inexpensive early-warning signals of impending change in ecological sustainability or integrity. They do so by revealing widespread and statistically significant changes in variables which reflect the ecological state of populations, communities, or ecosystems. In this role, the ecological anomalies revealed by the indicators provide the basis for generating hypotheses of cause and effect relationships. The relationships subsequently can be tested by rigorous field and laboratory research to quantify the impacts, and can be applied to system sensitivity tests by modeling to project future consequences. This approach is applicable to global indicators research if the measured changes over time in ecological state apply in many regions simultaneously and if global climate and GHG concentration changes provide obvious potential causes. Decline in amphibian numbers worldwide, and the recent documentation of increased circumpolar tundra vegetation productivity are examples of potential global change-related anomalies which require subsequent study to determine cause and effect and which would be appropriate subjects of research on U.S. biota for this competition.

Description of proposals requested

The most competitive proposals, in priority order, will be those which:

- utilize hypothesis testing in defining cause and-effect relationships between changing climate and GHG concentrations and documented ecological im pacts in the U.S.; and
- document indicators which function as early-warning signals of significant ecological impacts in the U.S. from changing climate.

One approach, for example, would use the implications of hypotheses underlying already-measured shifts in ecosystems to develop a suite of spatially varying indicators of changing ecological state. Each of the indicators might be ambiguous by itself, but in combination would provide a sound basis for documenting statistical probability of cause and effect. This “fingerprint” approach underlies climate change attributions in the 1996 IPCC (Intergovernmental Panel on Climate Change) Science of Climate Change Second Assessment Report. It could be applied to document ecological impacts, e.g., the impacts of high latitude warming on the forest-tundra border as combinations of changes in tree regeneration, woody plant growth, forest areal cover, leaf area density, and so on, in Alaskan boreal and lower U.S. montane alpine areas.

Another approach would extend known cause and effect relationships from the laboratory to the field by monitoring specific biotic variables of known critical importance to ecosystem function or structure. It would do so in a large enough suite

of locales that the hypothesized collective change in the variables and the system can be demonstrated statistically. The remote sensing of increasing canopy leaf area might be a suitable subject for this approach when measured simultaneously in several areas. Increasing canopy leaf area would be expected from increasing CO2 concentrations but would also be impacted by varying climate, UVB, and different amounts of other atmospheric gases (e.g., sulfur and nitrogen compounds, ozone).

Other approaches to the critical question of assigning (or eliminating) global change attribution to changes in ecological systems can be devised and are welcome. Potential for success of proposals can be enhanced significantly by clarity in organization and in writing about proposed research approaches, methods to implement them, and expected research outcomes.

Funding: Approximately $5 million, with a projected award range from $75,000 to $250,000 per award per year, and an approximate duration of 3 years, will be available. Awards are subject to the availability of funds.

C. Interindividual Variation in Human Susceptibility to Environmentally-caused Disease

EPA's current approach to risk assessment has not adequately accounted for human variability due to intrinsic and extrinsic factors. An emerging body of evidence suggests that person-to-person differences in metabolism, genetic pre-disposition, physical environment, and age (infants, children, and elderly) may place certain groups of individuals at an increased risk from environmental stressors. This can result in decreased quality of life and increased illness and mortality.

The traditional standard default approaches used in risk assessment may underestimate the impact of environmental agents on particular groups of individuals. These approaches do not adequately account for the variability in human biological responses to toxic chemicals. Expanded investigation in this area will benefit risk assessment by providing the tools to identify and characterize high risk groups and by providing fundamental data to develop predictive approaches and more reliable assessment methods.

Therefore, proposals are requested to evaluate the role that interindividual variation plays in the susceptibility of humans to disease caused by environmental agents. Susceptibility can be a function of intrinsic factors such as age, sex, race, and/or genetic polymorphisms; it may also be due to extrinsic factors such as unique patterns of exposure. Those factors which can have an effect on the susceptibility of individuals to specific disease need to be identified and quantitated in the general population. Although molecular epidemiological approaches are of interest, studies on experimental animal models which can be extrapolated to humans are also appro-

priate. Studies which incorporate data into the development of dose-response models for use in risk assessment are of particular interest.

Funding: Approximately $2 million is expected to be available in FY 98 for new research grants. The projected award range is $100,000 to $200,000/year for up to 3 years. Awards are subject to the availability of funds.

Eligibility

Academic and not-for-profit institutions located in the U.S., and state or local governments are eligible under all existing authorizations. Profit making firms and other federal agencies are not eligible to receive assistance from EPA under this program.

Federal employees may cooperate or collaborate with eligible applicants within the limits imposed by applicable legislation and regulations. However, federal agencies, national laboratories funded by federal agencies (FFRDCs), and federal employees are not eligible to submit applications to this program and may not serve in a principal leadership role on a grant. The principal investigator's institution may subcontract to a federal agency to purchase unique supplies or services unavailable in the private sector. Examples are purchase of satellite data, census data tapes, chemical reference standards, analyses or instrumentation not available elsewhere, etc. A written justification for such federal involvement must be included in the application, along with an assurance from the federal agency which commits it to supply the specified service.

Potential applicants who are uncertain of their eligibility should contact Dr. Robert E. Menzer in NCERQA, phone (202) 564-6849, EMail: menzer.robert@epamail.epa.gov

Standard Instructions for Submitting an Application

This section contains a set of special instructions related to how applicants should apply for an NCERQA grant under the appropriate solicitation. Proposed projects must be for research designed to advance the state of knowledge in the research areas described in this solicitation.

Sorting Codes

In order to facilitate proper assignment and review of applications, each applicant is asked to identify the topic area in which their application is to be considered. **It is the responsibility of the applicant to correctly identify the proper sorting code.** Failure to do so will result in an inappropriate peer review assignment. At various places within the application, applicants will be asked to identify this topic area by using the appropriate Sorting Code. The Sorting Codes correspond to the topic areas within the solicitation. The Sorting Codes and application deadlines for this solicitation are shown below:

Topic Area	Sorting Code	Due Date
Exploratory Research		
environmental biology	98-NCERQA-A1	**March 31,1998**
human health	98-NCERQA-A2	**December 16, 1997**
environmental chemistry	98-NCERQA-A3	**December 16, 1997**
physics	98-NCERQA-A4	**March 12, 1998**
environmental engineering	98-NCERQA-A5	**March 12, 1998**
Indicators of Global Climate Change	98-NCERQA-B1	**February 12, 1998**
Interindividual Variation in Human Susceptibility to Environmentally-caused Disease	98-NCERQA-C1	**February 12, 1998**

The Sorting Code must be placed at the top of the abstract (as shown in the abstract format), in Box 10 of Standard Form 424 (as described in the section on SF424), and should also be included in the address on the package that is sent to EPA (see the section on how to apply).

The Application

The initial application is made through the submission of the materials described below. **It is essential that the application contain all the information requested and be submitted in the formats described**. If it is not, the application may be rejected on administrative grounds. If an application is considered for award, (i.e., after external peer review and internal review) additional forms and other information will be requested by the Project Officer. **The application should not be bound or stapled in any way.** *The Application contains the following:*

A. Standard Form 424: The applicant must complete Standard Form 424 (see attached form and instructions). This form will act as a cover sheet for the application and **should be its first page.** Instructions for completion of the SF424 are included with the form. The form must contain the original signature of an authorized representative of the applying institution. Please note that both the Principal Investigator and an administrative contact should be identified in Section 5 of the SF424.

B. Key Contacts: The applicant must complete the Key Contacts Form (attached) as the **second page** of the submitted application.

C. Abstract: ***The abstract is a very important document.*** Prior to attending the peer review panel meetings, some of the panelists may read only the abstract. Therefore, it is critical that the abstract accurately describe the research being proposed and convey all the essential elements of the research. Also, in the event of an award, the abstracts will form the basis for an Annual Report of awards made under this program. The abstract should include the following information:

1. Sorting Code: Use the correct code that corresponds to the appropriate RFA topic. (Be sure to substitute the appropriate code for the "XX" in 98-NCERQA-XX).

2. Title: Use the exact title as it appears in the rest of the application.

3. Investigators: List the names and affiliations of each investigator who will significantly contribute to the project. Start with the Principal Investigator.

4. Project Summary: This should summarize: (a) the **objectives** of the study (including any hypotheses that will be tested), (b) the experimental **approach** to be used (which should give an accurate description of the project as described in the proposal), (c) the **expected results** of the project and how it addresses the research needs identified in the solicitation, and (d) the estimated **improvement in risk assessment or risk management** that will result from successful completion of the work proposed.

5. Supplemental Keywords: A list of suggested keywords is provided for your use. Do not duplicate terms already used in the text of the abstract.

D. Project Description: This description must not exceed fifteen (15) consecutively numbered (center bottom), 8.5x11 inch pages of single-spaced standard 12-point type with 1 inch margins. The description must provide the following information:

1. Objectives: List the objectives of the proposed research and the hypotheses being tested during the project and briefly state why the intended research is important. This section can also include any background or introductory information that would help explain the objectives of the study (one to two pages recommended).

2. Approach: Outline the methods, approaches, and techniques that you intend to employ in meeting the objective stated above (five to 10 pages recommended).recommended).

3. Expected Results or Benefits: Describe the results you expect to achieve during the project, the benefits of success as they relate to the topic under which the proposal was submitted, and the potential recipients of these benefits. This section should also discuss the utility of the research project proposed for addressing the environmental problems described in the solicitation (one to two pages recommended).

4. General Project Information: Discuss other information relevant to the potential success of the project. This should include facilities, personnel, project schedules, proposed management, interactions with other institutions, etc. (one to two pages recommended).

5. Important Attachments: Appendices and/or other information may be included but must remain within the 15 page limit. References cited are in addition to the 15 pages.

E. Resumes: The resumes of all principal investigators and important co-workers should be presented. Resumes must not exceed two consecutively numbered (bottom center), 8.5x11 inch pages of single-spaced standard 12-point type with 1 inch margins for each individual.

F. Current and Pending Support: The applicant must identify any current and pending financial resources that are intended to support research related to that included in the proposal or which would consume the time of principal investigators. This should be done by completing the appropriate form (see attachment) for each investigator and other senior personnel involved in the proposal. Failure to provide this information may delay consideration of your proposal.

G. Budget: The applicant must present a detailed, itemized budget for the entire project. This budget must be in the format provided in the example (see attachment) and not exceed two consecutively numbered (bottom center), 8.5x11 inch pages with 1 inch margins. Please note that institutional cost sharing is not required and, therefore, does not have to be included in the budget table. If desired, a brief statement concerning cost sharing can be added to the budget justification.

H. Budget Justification: This section should describe the basis for calculating the *personnel, fringe benefits, travel, equipment, supplies, contractual support,* and *other* costs identified in the itemized budget and explain the basis for their calculation (special attention should be given to explaining the *travel, equipment, and other categories*). This should also include an explanation of how the indirect costs were calculated. This justification should not exceed two consecutively numbered (bottom center), 8.5x11 inch pages of single-spaced standard 12-point type with 1 inch margins.

I. Quality Assurance Narrative Statement: For any project involving data collection or processing, conducting surveys, environmental measurements, and/or modeling, provide a statement on how quality processes or products will be assured. This statement should not exceed two consecutively numbered, 8.5x11 inch pages of single-spaced standard 12-point type with 1 inch margins. This is in addition to the 15 pages permitted for the Project Description. The Quality Assurance Narrative Statement should, for each item listed below, either present the required information or provide a justification as to why the item does not apply to the proposed research. For awards that involve environmentally related measurements or data generation, a quality system that complies with the requirements of ANSI/ASQC E4, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs," must be in place.

1. The activities to be performed or hypothesis to be tested (reference may be made to the specific page and paragraph number in the application where this information may be found); criteria for determining the acceptability of data quality in terms of precision, accuracy, representativeness, completeness, comparability.

2. The study design including sample type and location requirements and any statistical analyses that were used to estimate the types and numbers of samples required for physical samples or similar information for studies using survey and interview techniques.

3. The procedures for the handling and custody of samples, including sample identification, preservation, transportation, and storage.

4. The methods that will be used to analyze samples or data collected, including a description of the sampling and/or analytical instruments required.

5. The procedures that will be used in the calibration and performance evaluation of the sampling and analytical methods used during the project.

6. The procedures for data reduction and reporting, including a description of statistical analyses to be used and of any computer models to be designed or utilized with their associated with verification and validation techniques.

7. The intended use of the data as they relate to the study objectives or hypotheses.

8. The quantitative and or qualitative procedures that will be used to evaluate the success of the project.

9. Any plans for peer or other reviews of the study design or analytical methods prior to data collection.

ANSI/ASQC E4, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" is available for purchase from the American Society for Quality Control, phone 1-800-248-1946, item T55. Only in exceptional circumstances should it be necessary to consult this document.

J. Postcard: The Applicant must include with the application a self addressed, stamped 3x5 inch post card. This will be used to acknowledge receipt of the application and to transmit other important information to the applicant.

How to Apply

The original and ten (10) copies of the fully developed application and five (5) additional copies of the abstract (15 in all), must be received by NCERQA no later than 4:00 P.M. EST on the closing date assigned to the topic area appropriate to the application (see Sorting Codes section):

The application and abstract must be prepared in accordance with these instructions. Informal, incomplete, or unsigned proposals will not be considered. The application should not be bound or stapled in any way. The original and copies of the application should be secured with paper or binder clips.

Completed applications should be sent via regular mail to:

U.S. Environmental Protection Agency
Peer Review Research Division (8703R)
Sorting Code: 98-NCERQA-XX **(replace the "XX" with the appropriate code)**
401 M Street, SW
Washington DC 20460

For **express** mail applications, the following address must be used:

U.S. Environmental Protection Agency
Peer Review Division (8703R)
Sorting Code: 98-NCERQA-XX **(replace the "XX" with the appropriate code)**
1300 Pennsylvania Avenue, NW
Room B-10105
Washington, DC 20004

Phone: (202) 564-6939 (for express mail applications)

The sorting code must be identified in the address (as shown above). Please do not fail to replace the "XX" in 98-NCERQA-XX with the appropriate code.

Guidelines, Limitations, and Additional Requirements

Proposals must be submitted to only one topic area, using a single sorting code. Proposals submitted to more than one RFA topic will be assigned to the topic designated on the first version received or to the first sorting code designated on the application. If you wish to submit more than one application, you must ensure that the research proposed is significantly different from that in any other that has been submitted to this solicitation or from any other grant you are currently receiving from EPA or any other federal government agency.

Projects which contain subcontracts constituting more than 40% of the total direct cost of the grant for each year in which the subcontract is awarded will be subject to special review and may require additional justification.

Researchers will be expected to budget for and participate in an annual All-Investigators Meeting with EPA scientists and other grantees to report on research activities and to discuss issues of mutual interest.

Review and Selection

All grant applications are initially reviewed by EPA to determine their legal and administrative acceptability. Acceptable applications are then reviewed by an appropriate technical peer review group. This review is designed to evaluate each proposal according to its scientific merit. In general, each review group is composed of non-EPA scientists, engineers, social scientists, and/or economists who are experts in their respective disciplines and are proficient in the technical areas they are reviewing. The reviewers use the following criteria to help them in their reviews:

1. The originality and creativity of the proposed research, the appropriateness and adequacy of the research methods proposed, and the appropriateness and adequacy of the Quality Assurance Narrative Statement. Is the research approach practical and technically defensible, and can the project be performed within the proposed time period? Will the research contribute to scientific knowledge in the topic area of the solicitation? Is the proposal well-prepared with supportive information that is self-explanatory and understandable?

2. The qualifications of the principal investigator(s) and other key personnel, including research training, demonstrated knowledge of pertinent literature, experience, and publication records. Will all key personnel contribute a significant time commitment to the project?

3. The availability and/or adequacy of the facilities and equipment proposed for the project. Are there any deficiencies that may interfere with the successful completion of the research?

4. The responsiveness of the proposal to the research needs identified for the topic area. Does the proposal adequately address all of the objectives specified for this topic area?

5. Although budget information is not used by the reviewers as the basis for their evaluation of scientific merit, the reviewers are asked to provide their view on the appropriateness and/or adequacy of the proposed budget and its implications for the potential success of the proposed research. Input on requested equipment is of particular interest.

Applications that receive scores of excellent and very good from the peer reviewers are subjected to a programmatic review within EPA, the object being to assure a balanced research portfolio for the Agency. Scientists from the ORD Laboratories and EPA Program and Regional Offices review these applications in relation to program priorities and their complementarity to the ORD intramural program and recommend selections to NCERQA.

Funding decisions are the sole responsibility of EPA. Grants are selected on the basis of technical merit, relevancy to the research priorities outlined, program balance, and budget. A summary statement of the scientific review by the peer panel will be provided to each applicant.

Applications selected for funding will require additional certifications, possibly a revised budget, and responses to any comments or suggestions offered by the peer reviewers. Project officers will contact principal investigators to obtain these materials.

Proprietary Information

By submitting an application in response to this solicitation, the applicant grants EPA permission to share the application with technical reviewers both within and outside of the Agency. Applications containing proprietary or other types of confidential information will be returned to the applicant without review.

Funding Mechanism

The funding mechanism for all awards issued under this solicitation will consist of grants from EPA and depends on the availability of funds. In accordance with Public Law 95-224, the primary purpose of a grant is to accomplish a public purpose of support or stimulation authorized by Federal statute rather than acquisition for the direct benefit of the Agency. In issuing a grant agreement, EPA anticipates that there will be no substantial EPA involvement in the design, implementation, or conduct of the research funded by the grant. However, EPA will monitor research progress, based in part on annual reports provided by awardees.

Contacts

Additional general information on the grants program, forms used for applications, etc., may be obtained by exploring our Web page at <**http://www.epa.gov/ncerqa**>. EPA does not intend to make mass mailings of this announcement. Information not available on the Internet may be obtained by contacting:

U.S. Environmental Protection Agency
National Center for Environmental Research and Quality Assurance (8703R)
401 M Street, SW
Washington DC 20460

Hotline Phone: 1-800-490-9194

In addition, a contact person has been identified below for each topic within the RFA. These individuals will usually be the Project Officers for the grants funded under a particular topic. They will respond to inquires regarding the solicitation and can respond to any technical questions related to your application.

Exploratory Research

- Clyde Bishop 202-564-6914
  bishop.clyde@epamail.epa.gov

Indicators of Global Climate Change

- Barbara Levinson 202-564-6911
  levinson.barbara@epamail.epa.gov

Interindividual Variation in Human Susceptibility to Environmentally-caused Disease

- David Reese 202-564-6919
  reese.david@epamail.epa.gov

OMB Approval No. 0348-0043

APPLICATION FOR FEDERAL ASSISTANCE

2. DATE SUBMITTED	Applicant Identifier
3. DATE RECEIVED BY STATE	State Applicant Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

1. TYPE OF SUBMISSION

Application	*Preapplication*
☐ Construction	☐ Construction
☐ Non-Construction	☐ Non-Construction

5. APPLICANT INFORMATION IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? ☐ YES ☐ NO IF YES, LIST ACRONYM(S)

Legal Name:

Organizational Unit:

Address ***(give city, county, state, and zip code)***:

Name and telephone and E-mail number of the person to be contacted on matters involving this application ***(give area code)***

PI:

ADMIN. CONTACT:

6. EMPLOYER IDENTIFICATION NUMBER (EIN):

☐☐ – ☐☐☐☐☐☐☐

7. TYPE OF APPLICANT: ***(enter appropriate letter in box)*** ☐

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) _____

8. TYPE OF APPLICATION:

☐ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es): ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other ***(specify):***

_____

9. NAME OF FEDERAL AGENCY:

U.S. Environmental Protection Agency - ORD - NCERQA

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 66.500

TITLE: **98-NCERQA - _ _ _**

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:

12. AREAS AFFECTED BY PROJECT ***(cities, counties, states, etc.):***

13. PROPOSED PROJECT:		14. CONGRESSIONAL DISTRICTS OF:	
Start Date	Ending Date	a. Applicant	b. Project

15. ESTIMATED TOTAL PROJECT FUNDING:	
a. Federal	$ .00
b. Applicant	$ .00
c. State	$ .00
d. Local	$ .00
e. Other	$ .00
f. Program Income	$ .00
g. TOTAL	$ .00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:

DATE _____

b. NO. ☐ PROGRAM IS NOT COVERED BY E.O. 12372

☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?

☐ Yes If "Yes," attach an explanation. ☐ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Typed Name of Authorized Representative	b. Title	c. Telephone number
d. Signature of Authorized Representative		e. Date Signed

Previous Editions Not Usable
Prescribed by OMB Circular A-102

Standard For 424 (REV 4-88)

Authorized for Local Reproduction

INSTRUCTIONS FOR THE SF 424

This is a standard form used by applicants as a required facesheet for preapplications and applications submitted for Federal Assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

Item: Entry:

1. Self-explanatory.

2. Date application submitted to Federal agency (or State, if applicable) & applicant's control number (if applicable).

3. State use only (if applicable).

4. If this application is to continue or revise an existing award, enter present Federal identifier number. If for a new project, leave blank.

5. Legal name of applicant, name of primary organizational unit which will undertake the assistance activity, complete address of the applicant, and name and telephone number of the person to contact on matters related to this application.

6. Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.

7. Enter the appropriate letter in the space provided.

8. Check appropriate box and enter appropriate letter(s) in the space(s) provided:

   — "New" means a new assistance award.

   — "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date.

   — "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation.

9. Name of Federal agency from which assistance is being requested with this application.

10. Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is required.

11. Enter a brief descriptive title of the project. If me than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.

Item: Entry:

12. List only the largest political entities affected (e.g., State, counties, cities.)

13. Self-explanatory.

14. List the applicant's Congressional Districts and any District(s) affected by the program or project.

15. Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in-kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, include *only* the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15.

16. Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.

17. This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit allowances, loans and taxes.

18. To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.

KEY CONTACTS FORM

☐ **Authorized Representative:** *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____

☐ **Payee:** *Individual authorized to accept payments.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____

☐ **Administrative Contact:** *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc.)*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____
FAX Number: _____
E-Mail Number: _____

☐ **Principal Investigator:** *Individual responsible for the technical completion of the proposed work.*

Name: _____
Title: _____
Complete Address: _____

_____
Phone Number: _____
FAX Number: _____
E-Mail Number: _____

EPA STAR Grant Abstract *(Example Format)*

Sorting Code: *98-NCERQA-XX (use the correct code that corresponds to the appropriate RFA topic)*
Title: *Use the exact title as it appears in the rest of the application.*
Investigators: *List the names and affiliations of each investigator who will significantly contribute to the project. Start with the Principal Investigator.*
Institution: *Name of university or other applicant.*
Project Period: *October 1, 1998--September 30, 2000, for example.*
Research Category: *Enter your research topic name.*

Project Summary:

Objectives/Hypothesis: *include a short statement on the context of the proposed research in relation to other environmental research in the particular area of work*

Approach: *outline the methods, approaches, and techniques you intend to employ in meeting the objectives*

Expected Results:

including a brief description of the
Improvements in Risk Assessment or Risk Management
that will be realized if the expected results are achieved

Supplemental Keywords: *see attached suggestions. Do not duplicate terms used in the text of the abstract.*

SUGGESTED KEYWORDS

Media: (media, air, ambient air, atmosphere, ozone, water, drinking water, watersheds, groundwater, land, soil, sediments, acid deposition, global climate, indoor air, mobile sources, CASTNET, stratospheric ozone, tropospheric, marine, estuary, precipitation, leachate, adsorption, absorption, chemical transport)

Risk Assessment: (exposure, risk, risk assessment, effects, health effects, ecological effects, human health, bioavailability, metabolism, vulnerability, sensitive populations, dose-response, carcinogen, teratogen, mutagen, animal, mammalian, organism, cellular, population, enzymes, infants, children, elderly, stressor, age, race, diet, metabolism, genetic pre-disposition, genetic polymorphisms, sex, ethnic groups, susceptibility, cumulative effects)

Chemicals, toxics, toxic substances: (chemicals, toxics, particulates, ODS, VOC, CFC, PAH, PNA, PCB, dioxin, metals, heavy metals, solvents, oxidants, nitrogen oxides, sulfates, organics, DNAPL, NAPL, pathogens, viruses, bacteria, acid rain, effluent, discharge, dissolved solids, intermediates)

Ecosystem Protection: (ecosystem, indicators, restoration, regionalization, scaling, terrestrial, aquatic, habitat, integrated assessment)

Risk Management: pollution prevention (green chemistry, life-cycle analysis, alternatives, sustainable development, clean technologies, innovative technology, renewable, waste reduction, waste minimization, environmentally conscious manufacturing); treatment (remediation, bioremediation, cleanup, incineration, disinfection, oxidation, restoration)

Public Policy: (public policy, decision making, community-based, cost-benefit, conjoint analysis, observation, non-market valuation, contingent valuation, survey, psychological, preferences, public good, Bayesian, socio-economic, willingness-to-pay, compensation, conservation, environmental assets, sociological)

Scientific Disciplines: (environmental chemistry, marine science, biology, physics, engineering, social science, ecology, hydrology, geology, histology, epidemiology, genetics, pathology, mathematics, limnology, entomology, zoology)

Methods/Techniques: (EMAP, modeling, monitoring, analytical, surveys, measurement methods, general circulation models, climate models, satellite, landsat, remote sensing)

Geographic Areas: (Northeast, central, Northwest, Chesapeake Bay, Great Lakes, Midwest, Mid-Atlantic, states: {use both full name and two letter abbreviation}, EPA Regions 1 through 10)

Sectors: (agriculture, business, transportation, industry {petroleum, electronics, printing, etc}:{identify 4 digit SIC codes}, service industry, food processing, etc)

Current and Pending Support

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator:	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ Transfer of Support
Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
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Project/Proposal Title:

Source of Support:
Total Award Amount: $ Total Award Period Covered:
Location of Project:
Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Itemized Budget for EPA STAR Grant Applications *(Example Format)*

CATEGORIES	YEAR ONE	YEAR TWO	YEAR THREE	TOTAL PROJECT
a. Personnel Principal Investigator Co-PI Research Scientists Postdoctoral Scientists Other Personnel				
TOTAL PERSONNEL COSTS				
b. Fringe Benefits _____% of _____				
c. Travel Trip 1 Trip 1 Trip 1 ...etc.				
TOTAL TRAVEL COSTS				
d. Equipment Item 1 Item 2 Item 3 ...etc.				
TOTAL EQUIPMENT COSTS				
e. Supplies Item 1 Item 2 Item 3 ...etc.				
TOTAL SUPPLY COSTS				
f. Contracts 1 2 3 ...etc.				
TOTAL CONTRACTUAL COSTS				
g. Other Item 1 Item 2 Item 3 ...etc.				
TOTAL OTHER COSTS				
h. TOTAL DIRECT COSTS (sum of a-g)				
i. Indirect Costs/Charges _____% of _____ (base)				
j. TOTAL PROJECT COSTS (sum of h & i)				
k. TOTAL REQUESTED FROM EPA				

DO NOT USE THIS FORM -- Example 0nly --